TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT

IN-LINE RADIATION DETECTION AT VERY LOW LEVELS IN WASTEWATER

Identification No.: RL-DD083
Date: November 2001

Program: River Corridor Waste Management
OPS Office/Site: Richland Operations Office/Hanford Site
PBS No.: RL-RC05
Waste Stream: 300 Area Process Sewer
TSD Title: 300 Area Treated Effluent Disposal Facility
Operable Unit (if applicable): N/A
Waste Management Unit (if applicable): N/A
Facility: 300 Area Treated Effluent Disposal Facility, Hanford's 300 Area

Priority Rating:

This entry addresses the "Accelerated Cleanup: Paths to Closure (ACPC)" priority:

____ 1. Critical to the success of the ACPC.
____ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high life-cycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays).
_X_ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

Need Title: In-line Radioactivity Detection at Very Low Levels in Wastewater

Need/Opportunity Category: *Technology Opportunity* -- The Site desires capability to perform on-line monitoring of a wastewater stream for radioactivity at very low levels.

Need Description: The 300 Area Treated Effluent Disposal Facility (TEDF) is a non-nuclear facility that treats industrial wastewater and discharges it to the Columbia River under an NPDES permit. The bulk of the water treated at the TEDF is collected and transported through the 300 Area Process Sewer. The Process Sewer has connections to approximately 45 buildings in the 300 Area. Even though physical and administrative controls exist to preclude entry of radioactive material in to the Process Sewer system, upsets have occurred and have the potential to occur in the future. The TEDF does not include any treatment for radioactive constituents and must meet drinking water standards in the effluent. See standards noted in *Functional Performance Requirements*.

A monitoring system is needed to mitigate the impacts of radiological upsets in the Process Sewer and ensure compliance with discharge limits.

Schedule Requirements:

Earliest Date Required: N/A
Latest Date Required: N/A

There are no particular schedule drivers.

Problem Description: See "Need Description" entry above.

Potential Life-Cycle Cost Savings of Need (in $000s) and Cost Savings Explanation: The only cost savings would be avoidance costs associated with a potential discharge criteria violation and associated clean up. This cannot adequately be qualified.

Benefit to the Project Baseline of Filling Need: Minimization of safety/environmental hazard potential located near the Columbia River.

Relevant PBS Milestone: N/A

Functional Performance Requirements: The selected technology should be capable of on-line real time monitoring of alpha and beta activity. The waste stream is industrial wastewater mostly from HVAC and equipment cooling water. The detector must be capable of detecting down to drinking water standards (15pCi/l alpha, 50pCi/l beta) with a high degree of operational reliability and little operator involvement.

Work Breakdown Structure (WBS) No.: 1.2.3.2.1, Maintain 300 Area LEF (TEFD) Readiness

TIP No.: N/A

Justification for Need:

Technical: Commercially available, on-line process detectors that are capable of sensing at state drinking water standard levels (e.g., 15pCi/l alpha, 50pCi/l beta) are not known to be available.

Regulatory: Availability of a monitoring system will significantly reduce the risk of the TEDF discharging wastewater in excess of the discharge criteria.

Environmental Safety and Health: Additional protection for the Columbia River.

Cultural/Stakeholder Concerns: None identified.

Other: None identified.

Current Baseline Technology: Currently no monitoring is being conducted on the combined Process Sewer stream. Composite samples are taken and analyzed in a lab monthly or after an upset.

End User: EM-30

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